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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/791,235	03/02/2004	Junichi Yamamoto	890050.464	3602

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EXAMINER	
MURALIDAR, RICHARD V	

ART UNIT	PAPER NUMBER
2838	

DATE MAILED: 07/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/791,235	YAMAMOTO, JUNICHI	
	Examiner	Art Unit	
	Richard V. Muralidar	2838	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 March 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 March 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

FINAL ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) The invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Fronk [U.S. 6181578].

With respect to Claim 1, [**amended**] Fronk discloses a switching power supply unit [Fig. 5 resonant reset forward converter] comprising a transformer [Fig. 5 transformer 12], a switching circuit disposed on a primary side of the transformer [Fig. 5 circuit formed by signal generator 40, voltage supply 11, and power switch 16], a self-driven type synchronous rectifier circuit disposed on a secondary side of the transformer and including two rectifier switches [Fig. 5 forward rectifier 112 and free-wheeling rectifier 116], and a self-oscillation stop circuit disposed on the secondary side of the transformer [Fig. 5 formed by quench FET 114, shadow transistor 42, rectifier 116, diode 48, capacitor 46, and resistor 44; col. 1 lines 43-47 and col. 3 lines 33-37] and adapted to turn off the two rectifier switches [Fig. 5 forward rectifier 112 and free wheeling rectifier 116] if a voltage between opposite ends of either of the two rectifier switches [specifically, rectifier 116] exceeds a predetermined value [col. 3 lines 33-37 and col. 6 lines 21-27; as shown in Fig. 5, Zener diode 48 is connected across the source and drain of rectifier 116 in such a manner that it will serve to protect rectifier

116 and inductor 118 from excessive over-voltage, by short circuiting (i.e. substantially turn off, because the shorted path through the Zener presents lower resistance to current flow) the source and drain through inductor 118 and resistor 44 respectively. Also, when rectifier 116 substantially turns off due to the excessive voltage, forward rectifier 112 will also turn off because inductor 118 is in series with and supplies current to rectifier 112].

With respect to Claim 2, [**amended**] Fronk discloses that the self-oscillation stop circuit includes a Zener diode [Fig. 5 Zener diode 48] connected in parallel with either of the two rectifier switches [Fig. 5 free wheeling rectifier 116].

With respect to Claim 3, [**amended**] Fronk discloses the Zener voltage of the Zener diode is determined so as to be higher than a voltage applied between the opposite ends either of the two rectifier switches [specifically, rectifier 116] during ordinary operation [the Zener diode functions as a protective voltage regulator when connected in parallel across a voltage sensitive device, such as rectifier 116, Fig. 5. If the Zener voltage rating were not chosen high enough for ordinary operation, rectifier 116 in parallel would receive a destructive over-voltage. Therefore the determined voltage across the Zener 48 must be higher than the voltage across the rectifier 116].

With respect to Claim 4, [**amended**] Fronk discloses that the Zener voltage of the Zener diode is determined so as to be lower than a withstand voltage of either of the two rectifier switches [in Fig. 5, the voltage of the Zener 48 must be lower than the withstand voltage of rectifier 116, or the rectifier 116 would receive a destructive over-voltage before the Zener could reverse breakdown to protect the rectifier 116].

With respect to Claims 5-8, **[amended]** Fronk discloses that the self-oscillation stop circuit [Fig. 5 formed by quench FET 114, shadow transistor 42, rectifier 116, diode 48, capacitor 46, and resistor 44; col. 1 lines 43-47 and col. 3 lines 33-37] is constituted so as to turn off the two rectifier switches [Fig. 5 free wheeling rectifier 116 and forward rectifier 112] by substantially short circuiting a gate and a source of the two rectifier switches [in Fig. 5, the output of the discharge network signal at node 410 turns on and off rectifier 116, which starts and stops free wheeling/oscillations by shorting the gate and source of rectifier 116 through quench FET 114 and inductor 118; col. 5 lines 10-42. Additionally, the gate and source of forward rectifier 112 is short-circuited through inductor 118 whenever rectifier 116 turns on].

With respect to Claim 9, [new] Fronk discloses a switching power supply unit [Fig. 5 resonant reset forward converter], comprising: a transformer [Fig. 5 transformer 12]; a switching circuit coupled to a primary side of the transformer [Fig. 5 circuit formed by signal generator 40, voltage supply 11, and power switch 16]; a self-driven type synchronous rectifier circuit coupled to a secondary side of the transformer and including two rectifier switches [Fig. 5 forward rectifier 112 and free-wheeling rectifier 116]; and a self-oscillation stop circuit coupled to the secondary side of the transformer [Fig. 5 formed by quench FET 114, shadow transistor 42, rectifier 116, diode 48, capacitor 46, and resistor 44; col. 1 lines 43-47 and col. 3 lines 33-37] and adapted to simultaneously turn off the two rectifier switches if a respective voltage between the two terminals, of either of the two rectifier switches, exceeds a value [as shown in Fig. 5, Zener diode 48 is connected across the source and drain of rectifier 116 in such a

manner that it will serve to protect rectifier 116 and inductor 118 from excessive over-voltage, by short circuiting (i.e. substantially turn off, because the shorted path through the Zener presents lower resistance to current flow) the source and drain through inductor 118 and resistor 44 respectively. Also, when rectifier 116 substantially turns off due to the excessive voltage, forward rectifier 112 will also turn off because inductor 118 is in series with and supplies current to rectifier 112; thus both rectifier switches will substantially turn off simultaneously].

With respect to Claim 10, [new] Fronk discloses that the stop circuit includes a Zener diode [Fig. 5 Zener diode 48] have a Zener voltage that is associated with said value, wherein the stop circuit is adapted to turn off the two rectifier switches if the respective voltage between their two terminals exceeds the Zener voltage [as shown in Fig. 5, Zener diode 48 is connected across the source and drain of rectifier 116 in such a manner that it will serve to protect rectifier 116 and inductor 118 from excessive over-voltage, by short circuiting (i.e. substantially turn off, because the shorted path through the Zener presents lower resistance to current flow) the source and drain through inductor 118 and resistor 44 respectively. Also, when rectifier 116 substantially turns off due to the excessive voltage, forward rectifier 112 will also turn off because inductor 118 is in series with and supplies current to rectifier 112; thus both rectifier switches will substantially turn off simultaneously].

With respect to Claim 11, [new] Fronk discloses that the two rectifier switches comprise two transistors [Fig. 5, transistor switches 112 and 116], and wherein the two terminals comprise source and drain terminals of the two transistors.

With respect to Claim 12, [new] Fronk discloses that the stop circuit is adapted to turn off the two rectifier switches be substantially short-circuiting gate and source terminals of the two rectifier switches [in Fig. 5, the output of the discharge network signal at node 410 turns on and off rectifier 116, which starts and stops free wheeling/oscillations by shorting the gate and source of rectifier 116 through quench FET 114 and inductor 118; col. 5 lines 10-42. Additionally, the gate and source of forward rectifier 112 is short-circuited through inductor 118 whenever rectifier 116 turns on].

With respect to Claim 13, [new] Fronk discloses that the stop circuit includes a Zener diode coupled in parallel to at least one of the rectifier switches [Fig. 5 rectifier 116] between the two terminals [the Zener is coupled in parallel across the source and drain of rectifier 116] of said at least one rectifier switch, the Zener diode having a Zener voltage that provides said value [inherent].

Response to Arguments

Applicant's arguments filed 03/27/2006 have been fully considered but they are not persuasive, for the following reasons:

Applicant argues (on pages 9 and 10 of applicant's REMARKS) that Fronk's [U.S. 6181578] Zener diode 48 is used to maintain the voltage across capacitor 46 at the gate of the freewheeling rectifier 116. This is correct, as applicant states in col. 6 lines 27-29. However, the Examiner finds that, the presence of Zener diode 48 also accomplishes a voltage protection function with an *inherent* signaling capability (using a

broad but reasonable interpretation). When Zener 48 goes into reverse breakdown to affect its excessive-voltage protection function, a secondary low resistance path is created for current to flow to ground, which essentially signals or causes the rectifier 116 to essentially stop conducting and allow the excessive current to instead be shunted to ground through the protective Zener.

Applicant argues (on pages 9 and 10 of applicant's REMARKS) that Fronk's [U.S. 6181578] Zener diode 48 is not used in circuitry to detect a voltage applied between opposite ends of *either of two rectifier switches*, and that is does not provide a turn off signal for two rectifier switches if the Zener turns on. Although not expressly stated by Fronk, it is readily apparent from the way Zener 48 is connected in Fig. 5 that it is serving an excessive-voltage protection function for rectifier 116, by sensing the voltage applied across the opposite ends of rectifier 116. In the presence of an excessive voltage, Zener 48 will reverse breakdown and conduct rapidly, and will present a lower resistance path for excess current to safely flow to ground. The reverse breakdown of *the Zener 48 itself* constitutes the turn off signal to rectifier 116, since the current will be shunted through the protective Zener instead of rectifier 116 in the event of excessive voltage; i.e., current flow switches from rectifier 116 to the Zener. Similarly, Zener 48 also signals rectifier 112 to turn off because when rectifier 116 stops conducting, inductor 118 will stop supplying current to rectifier 112, and since current will not longer be flowing, rectifier 112 will be effectively turned off. Therefore one turn off signal [the reverse breakdown of Zener 48], will effectively turn off rectifier 116 and rectifier 112.

Accordingly, THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a). A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard V. Muralidar whose telephone number is 571-272-8933. The examiner can normally be reached on 9:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Karl D. Easthom can be reached on 571-272-1989. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

6/5/2006
RVM

Adolf Deneke Berhane
Primary Examiner